

REMARKS

Applicant respectfully requests reconsideration and allowance of all pending claims in view of the above-amendments and the following remarks.

I. CLAIM AMENDMENTS

With this amendment, claims 2-4 are incorporated into independent claim 1.

Claims 2-4, 21-23 and 26-27 are cancelled.

Claims 29-31 are added as new independent claims, wherein:

- claim 29 is similar to previous claim 22, re-written into independent form;
- claim 30 is similar to previous claim 26, re-written into independent form; and
- claim 31 is similar to previous claim 27, re-written into independent form.

Similar amendments/limitations are added to independent claims 19, 20 and 28-31 as were added to independent claim 1.

According to the Office Action, claim 4 would be allowable if re-written into independent form. Thus claim 1 (and similarly amended independent claims) should be in condition for allowance.

II. CLAIM OBJECTIONS

Claims 3, 9 and 25 were objected to for minor informalities. With this amendment:

- the word "any" in claim 9 has been cancelled, as this was a typing mistake;
- the word "recuperated" has been replaced by "recovered" in claim 25, as suggested by the Examiner.

Concerning claim 3, which is now included in the new claim 1, it seems that the Examiner is confusing about how many dimensions each vectors of the invention has. According to pages 17 to 23 it is clear that the considered functions are applied to digital images, which is to say discrete bi-dimensional functions (page 17, lines 29-30).

The wavelet transformation of the image I 10 makes possible a multi-resolution representation of I , as illustrated by figure 1. At each level of resolution $2^j (j \leq -1)$, the representation of I 10 is provided by a rough image $A_{2^j} I$ 11 and by three detailed images $D_{2^j}^1 I$ 12, $D_{2^j}^2 I$ 13 and $D_{2^j}^3 I$ 14 (page 18, lines 5-9).

Thus, vectors $\vec{V}_{R1}(x,y)$, $\vec{V}_{R2}(x,y)$, $\vec{V}_M(x,y)$ are (and can only be) 2D vectors in the 2D base (x,y), expressed as a function of the three wavelet coefficients $D_{2'}^1 I$, $D_{2'}^2 I$, $D_{2'}^3 I$.

III. CLAIM REJECTIONS UNDER §101 and §112

Claim 21 was rejected as being directed to allegedly non-statutory subject matter.

Claim 21 is cancelled without prejudice.

IV. CLAIM REJECTIONS UNDER §102(e) Based on Reed

The Examiner considers that Reed (U.S. Publ. No. 2002/0067844) discloses all the features of claims 1-3, 18-22, 26 and 27.

Reed discloses a method of detecting a digital watermark embedded in a color image using infrared light. In particular, Reed describes a method of embedding a watermark in a quadrichromatic image (CMYK) in order to reduce the visibility of the watermark.

The Applicant does not agree with the Examiner and considers that claim 1 is new and involves inventive step in view of Reed.

Indeed, contrarily to the Examiner's opinion, on this very point, it seems that the Examiner is **confusing "vectors" and "the three designated colored components"**, which is linked with the explanation given above in §II.

REED et al. discloses a luminance digital watermarking, and the luminance is adjusted as a variation of the colored components, which it is made of.

More precisely, in REED et al., an image pixel, with a CMY color space representation, is watermarked with a luminance 3D vector of figure 1. The 3D vector coordinates are the value of each color component C, M, Y expressed as a percentage like in para. [0056]: "61% cyan, 50% magenta, 48% yellow". As a result, in REED et al. the watermark is a single 3D vector, expressed as a function of the colored component C, M, Y.

In the present application, in contrast, **three 2D vectors are taken into account in synergy for the insertion of the mark for at least one pixel (x,y)** of the image, for example. For instance, in the case of a CMY color space representation, three vectors $\vec{V}_C(x,y)$, $\vec{V}_M(x,y)$, $\vec{V}_Y(x,y)$ at a pixel (x,y) are expressed as a function of wavelet coefficients.

Then, a calculating rule is applied, to mark among these three vectors, the one that is positioned between the furthest vectors, named reference vectors (as it is mentioned in new claim 1).

To sum up, an example of the invention described in claim 1 is different from the one disclosed in REED et al., because it involves **a wavelet transform, which decomposes one pixel into one rough image and three detailed images, on which each component of the color space is 2D vectorially represented**. These 2D vectors are expressed as a function of wavelet coefficients. A step of selecting the vector to mark is then applied using a step of calculating the distance between any two vectors of said at least three vectors.

Finally, REED et al. **neither discloses nor suggests the addition of a marking selected to suit at least one local characteristic of the said image** as it is disclosed in pages 12 lines 10-11 of the present application and recited in at least one of the claims.

The above-differences are not intended to limit the scope of the claims but to provide examples of differences between one or more embodiments of the disclosure and Reed et al. The scope of the claims should be determined by the language of the claims only.

V. CLAIM REJECTIONS UNDER §103(a)

A. **ALATTAR (“*Smart Images Using Digimarc’s Watermarking technology*”)**

The Examiner considers that Reed (US 2002/0067844) discloses all the features of dependent claim 17, except the feature according to which said mark is a pseudo-random binary signature written in a redundant manner.

The Examiner considers that Alattar (“*Smart Images’ using Digimarc’s watermarking technology*”) teaches such a feature. He concludes that it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the teachings of Alattar in the watermarking system of Reed, and thus to obtain claim 17.

The Applicant disagrees with the Examiner and considers that dependent claim 17 (in view of new claim 1) is new and involves an inventive step in view of the combination of Reed and Alattar.

Indeed, neither REED et al. nor ALATTAR discloses a vectorial watermarking approach as it is disclosed in the new claim 1.

B. **HAYASHI et al. (US – 6,535,616)**

This document relates to a watermarking technique involving a wavelet transform.

This technique, even if it discloses a wavelet transform, does not disclose a vectorial watermarking approach and a step of selecting the vector to mark is then applied using a step of calculating the distance between any two vectors of said at least three vectors.

Moreover, HAYASHI et al. neither discloses nor suggests the addition of a marking selected to suit at least one local characteristic.

C. MOSKOWITZ et al. (US – 5,889,868)

This document relates to a coding technique dedicated to watermarking.

This technique, even if it discloses the management of conflicts for the coding, does not disclose a vectorial watermarking approach and a step of selecting the vector to mark is then applied using a step of calculating the distance between any two vectors of said at least three vectors.

Moreover, MOSKOWITZ et al. neither discloses nor suggests the addition of a marking selected to suit at least one local characteristic.

D. RHOADS et al. (US 2003/0174862)

This document relates to a watermarking technique in a multimedia context.

This technique, even if it discloses an iterative method and a correlation calculation, does not disclose a vectorial watermarking approach and a step of selecting the vector to mark is then applied using a step of calculating the distance between any two vectors of said at least three vectors.

Moreover, MOSKOWITZ et al. neither discloses nor suggests the addition of a marking selected to suit at least one local characteristic.

Again, the above-differences are not intended to limit the scope of the claims but to provide examples of differences between one or more embodiments of the disclosure and the cited references. The scope of the claims should be determined by the language of the claims only and the elements contained therein. For example, if a claim does not require addition of a marking selected to suit at least one local characteristic, then the claim should not be limited in scope to that example.

In view of the above, all claims are believed to be in condition for allowance.

The Director is authorized to charge payment of any additional fees associated with this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,
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